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To:	Fax No:	Company:	Phone No.:
Examiner Allen J. Flanigan	571-273-8300	US PTO	

File No.: 06-0561

Re: Serial No.: 10/755,632
Filing Date: 1/12/2004
Group Art Unit: 3744
Confirmation No.: 1072

Date: June 4, 2007

No. Pages: Including Cover Sheet 112

Notes: Please find enclosed herewith the following documents relating to the above-referenced case:

- 1) Appellant's Amended Brief on Appeal having 18 pages;
- 2) Related Decisions having 94 pages.

PAGES 1-67

Fax 1 of 2

Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Baumann et al.) Examiner: Allen J. Flanigan
Serial No.: 10/755,632) Group Art Unit: 3744
Confirmation No.: 1072) Docket No.: 06-0561
)
For: High Conductivity Finstock Alloy,) Filed: January 12, 2004
Method of Manufacture and Resultant Product)

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June 4, 2007
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S AMENDED BRIEF ON APPEAL**1. Real Party in Interest**

The real party in interest of the present application is Alcoa Inc., the assignee of the entire right, title, and interest in the above-identified patent application.

2. Related Appeals and Interferences

No other appeals or interferences are known which directly affect, or will be directly affected by, or have a bearing on the disposition of the pending appeal.

3. Status of the Claims

The present application was filed on April 17, 2000, with Claims 1-28. In response to a Restriction Requirement imposed in an Office Action dated September 22, 2005, Appellants elected without traverse, to prosecute Claims 1-17, in a response dated October 20, 2005. The non-elected claims, i.e. 18-28, were subsequently withdrawn from examination.

A first Office Action on the merits issued December 12, 2005, including rejections under 35 U.S.C. §§ 102, and 103, to which Appellants filed an Amendment and Response dated March 13, 2006. In this response, Applicants amended Claims 1, 4, 10, 14, and 17. A Final Rejection was issued on May 8, 2006, in which the Examiner withdrew the rejections under 35 U.S.C. §102 but maintained the rejections under 35 U.S.C. §103. In response to the Final Rejection, Appellants submitted remarks in a Response under 37 C.F.R. §1.116, dated July 10, 2006, in

Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

which there were no amendments to the claims. An Advisory Action was issued on July 20, 2006, in which the Examiner maintained the rejection to Claims 1-17. A Request for Continued Examination was filed on September 8, 2006. A second Final Rejection was issued on December 18, 2006. Appellants filed a Notice of Appeal on January 18, 2007.

Thus, Claims 1-17 are the subject of this Appeal. These claims, as they presently stand, are set forth in the Appendix of this Appeal Brief. The status of each of the Claims is thus as follows:

Claims 1-17: Finally rejected and on appeal.

Claims 18-28: Withdrawn.

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4. Status of the Amendments

No amendments or remarks were filed following the Final Rejection dated December 18, 2006. Therefore, Claims 1-17 stand, on appeal, as recited in the Appellants' response dated July 10, 2006.

5. Summary of the Claimed Subject Matter

Independent claim 1, on appeal, relates to finstock comprising an aluminum alloy of about 0.7% to about 1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1.0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with a remainder comprising of Al and tolerable impurities, wherein the aluminum alloy when cast into an alloy strip and reduced by cold rolling produces a finstock that is substantially free of breakage. The inventive alloy when cast into an aluminum alloy strip is substantially free of coarse intermetallics, and is suitable for cold rolling into an aluminum alloy fin stock without resulting in cracking or breaking of the aluminum alloy strip. Referring to Paragraphs 0037-0050 of Applicant's disclosure, Applicant discloses that the claimed composition is suitable for aluminum fin stock when cast in a manner as to produce an alloy strip substantially without coarse intermetallics, such as primary Fe-bearing intermetallics, and without heavy bands of eutectic segregation in the form of centerline segregation. One example of a casting method that may be used in conjunction with the claimed composition is described in paragraphs 0061 to 0069 of Applicant's disclosure. Prior aluminum alloy's having an Fe content within the range

claimed by the Applicant's, could not be cold rolled without substantial cracking and therefore could not be utilized for a fin stock alloy.

Independent claim 10, on appeal, relates to a fin for a heat exchanger, the fin comprised of about 0.7% to about 1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1.0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with a remainder comprising of Al and tolerable impurities, wherein the aluminum alloy when cast into an alloy strip and reduced by cold rolling produces a finstock that is substantially free of breakage. The above description of the finstock alloy is applicable to independent claim 10. The inventive finstock is depicted in Figure 2.

Independent claim 14, on appeal, relates to a brazed aluminum heat exchanger comprising at least one tank structured to hold a coolant; a header plate coupled to said at least one tank, said header plate including a plurality of apertures; a plurality of substantially parallel fluid-carrying tubes each extending substantially perpendicular from one of said plurality of apertures in said header plate and structure to receive coolant therethrough; and a plurality of fins disposed between said plurality of fluid-carrying tubes, said fins being substantially free of cracks and in thermal communication with said plurality of fluid-carrying tubes and structured to transfer heat away therefrom, in order to cool said coolant as it circulates therein, said plurality of fins comprising: an aluminum alloy finstock comprised of about 0.7-1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1.0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with the remainder comprising Al and tolerable impurities. The above description of the finstock alloy is applicable to independent claim 14. The inventive finstock is depicted in Figure 2.

6. Grounds of Rejection to be Reviewed on Appeal

1. Do the combined disclosures of U.S. Patent No. 6,620,265 to Kawahara et al., and U.S. Patent No. 6,660,108 to Doko et al. render Claims 1-17, on appeal, unpatentable under 35 U.S.C. §103(a).

7. Argument

- I. **The combination of Kawahara et al. and Doko et al. fail to render unpatentable the Appellants' alloy, as recited in Claims 1-9, or Appellants' fin for a heat exchanger, as recited in Claims 10-14, or Appellants' brazed aluminum heat exchanger, as recited in Claims 15-17, which are directed to a brazed aluminum heat exchanger.**

Claims 1-9, relating to Appellants' Alloy, Claims 14, relating to Appellants' fin for a heat exchanger, and Claims 15-17 directed to a brazed aluminum heat exchanger, stand rejected under 35 U.S.C. §103(a) as allegedly obvious over the combination of Kawahara et al. and Doko et al. Appellants respectfully disagree with the Examiner's conclusion that the combination of Kawahara et al. and Doko et al. render the Appellants' invention obvious and submit the following.

To establish a prima facie case of obviousness three criteria must be met. First there must be some suggestion or motivation, either in the references themselves or the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1543, 1457-58 (Fed. Cir. 1998). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, the prior art reference (or references) combined must teach or suggest all of the claimed limitations. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

The Examiner's rejection can be summarized as follows: Referring to Page 2 of the Final Rejection dated May 8, 2006, the Examiner admits that the ranges of alloying elements in Appellants' claims are outside those taught in Kawahara et al., and relies upon the Federal Circuit decision in *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), for the proposition that "a prima facie case of obviousness exists where the claimed ranges and the prior art ranges do no overlap but are close enough that one skilled in the art would have expected them to have the same properties". Turning to the Final Rejection dated October 18, 2006, the Examiner further alleges that the difference between the lower limit of the

Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

value of Fe additive being claimed (greater than 2.0 wt %) and the upper limit of the Kawahara et al. recommended range (2.0 %) is virtually non-existent, being at the limit of measurable difference. The Examiner further alleges the disclosure of Kawahara et al. fails to teach away from increasing the Fe content to greater than 2.0. Finally, referring to the Final Rejection dated May 8, 2006, the Examiner alleges that Doko et al. teach that Fe values above 2.0 wt% can be successfully employed into the alloys disclosed in Kawahara et al. Appellants' respectfully disagree.

First, Kawahara et al. fails to render the Appellants' invention unpatentable, since the reference fails to teach or suggest each and every limitation of Appellants' Al-Fe-Si-Mn alloy, as recited in Claim 1, or Appellants' fin structure, as recited in Claim 10, or Appellants' heat exchanger, as recited in Claim 14. Specifically, Kawahara et al. fail to teach or suggest an Al-Fe-Si-Mn alloy including greater than 2.0 wt. %. Second, the disclosure of Kawahara et al. teaches that increasing the Fe content to greater than 2.0 wt % results in breakage of the alloy during processing, hence teaching away from increasing the Fe content to meet the limitations of Appellants' claims. Finally, Doko et al. fail to fulfill the deficiencies of the Kawahara et al. reference, since Doko et al. disclose an Al-Ni-Fe alloy that is far removed from Applicant's claimed Al-Fe-Si-Mn alloy. Appellant's arguments are now discussed in more detail.

a) Kawahara et al. fail to teach or suggest an Al-Fe-Si-Mn alloy having greater than 2.0 wt % Fe, as recited in Claims 1 and 10, since the alloy disclosed in Kawahara teaches 2.0 wt % Fe or less, and therefore fails to meet the claimed Fe limitation recited in Appellants' claims.

Kawahara et al. fail to render Appellants' claims unpatentable, under §103, since Kawahara et al. fail to teach or suggest each and every element of Appellants' invention. To establish a prima facie case of obviousness of a claimed invention all the claimed limitations must be taught or suggested by the prior art". *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 44, 496 (CCPA 1970). Specifically, the applied prior art fails to teach or suggest a crack free finstock formed of an Al-Fe-Si-Mn alloy containing greater than 2.0 wt % Fe, as recited in amended Claims 1, 10 and 14.

Kawahara et al. fail to render Appellants' invention obvious, since the applied reference fails to teach or suggest a crack free finstock formed of an Al-Fe-Si-Mn alloy containing greater than 2.0 wt % Fe, as recited in amended Claims 1, 10 and 14. It is noted that Appellants' claims recite that the Fe content be greater than 2.0 wt %, and do not recite that approximate language, such as "about", which allows for some variance or imprecision in the endpoint of the claimed range. Without broadening words that ordinarily receive some leeway, see *Modine Manufacturing Co. v. United States International Trade Commission*, 75 F.3d 1545, 1554, 37 USPQ2d 1609, 1615 (Fed.Cir.1996), the precise weight ranges do not "avoid [] a strict numerical boundary to the specified parameter," *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1217, 36 USPQ2d 1225, 1229 (Fed.Cir.1995). Appellants' claims clearly and definitively recite that the Fe content is greater than 2.0 wt %, a distinguishable feature not taught or suggested by the disclosure of Kawahara et al.

Kawahara et al. fails to provide a single reference to an alloy including greater than 2.0 wt% Fe that does not exhibit breakage in Fin Stock applications. Referring to Column 10, lines 16-18, of the Kawahara et al. reference, Kawahara et al. disclose that in order to provide an aluminum fin stock using the method disclosed therein, the Fe content must be defined to be more than 1.2 wt % by mass and 2.0 wt % by mass or less. Referring to Column 10, lines 16-25, Kawahara et al. disclose that the effect for preventing heat conductivity is not manifest when Fe is present in less than 1.2 wt % and that an Al-Fe series compound crystallizes at an early stage when the Fe content exceeds 2.0% by mass. It is further noted, that Kawahara et al. do not recite any approximate language relative to the Fe content of the Kawahara et al. composition that would warrant an expansive interpretation to include greater than 2.0 wt %. In fact, the Kawahara et al. reference teaches away from the Appellant's claimed Fe content. Referring to Column 10, lines 24-27, Kawahara et al. teach that crystallize materials resulting from the increased Fe content to greater than 2.0 wt % results in breakage of the fin material during the cold-roll step and cutting of the fin in assembling the core.

Referring to Page 2 of the Final Rejection dated May 8, 2006, despite acknowledging that the Appellants' claims are outside the alloy composition disclosed in Kawahara et al., the Examiner argues that a prima facie case of obviousness exists citing MPEP 2144.05 and *Titanium Metals Corp. v. Banner*, 778 F.2d 775 (Fed. Cir. 1985) for the proposition that "a case

Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellants' Brief on Appeal, filed June 4, 2007

of obviousness exists where the claimed ranges and the prior art do not overlap but are close enough that one skilled in the art would expect them to have the same properties. Appellants respectively disagree.

Appellants submit that the facts and holding of *Titanium Metals Corp. v. Banner* does not apply to the present fact scenario. The Federal Circuit in *Titanium Metals Corp.* held that three claims to a titanium alloy were unpatentable as being anticipated or obvious over a prior art publication. Different than the present case, in which Kawahara et al. fail to disclose an alloy composition within the composition recited in amended Claims 1, 10 and 14, the facts of *Titanium Metals Corp.* included a prior art publication that disclosed, and therefore anticipated a composition recited in the base claim and a first dependent claim. More specifically, although the prior art publication did not disclose the composition in the text of the publication, an alloy composition was included in a graph of the publication having 0.25 wt % Mo and .75 wt % Ni therefore being within the range of 0.2-0.4 wt % Mo and 0.6-0.9 wt % Ni recited in the claims.

The court in *Titanium Metals Corp.* also held that a second dependent claim to a singular alloy having 0.3 wt % Mo and 0.8 wt % Ni, was obvious in light of two alloys that had been disclosed on the prior art graph, one having 0.25 wt % Mo and 0.75 wt % Ni and the other having 0.31 wt % Mo and 0.94 % Ni. The court stated that despite failing to disclose a composition specifically including 0.3 wt % Mo and 0.8 wt % Ni, "the proportions were so close that one prima facie one skilled in the art would have expected them to have the same properties". Id. at 782. Contrary to the present rejection, in which the range disclosed in Kawahara et al. does not overlap Appellants' claimed Fe range, two prior art compositions disclosed in *Titanium Metals Corp.* provided a range that encompassed the claimed composition.

Further, the holding of *Titanium Metals Corp.* requires that the compositions be so similar so one having ordinary skill in the art would consider the compositions to have the same properties. In the present case, Kawahara et al. disclose that the Fe content is limited to less than 2.0 wt % Fe to avoid breakage in finstock during cold rolling, and therefore fails to provide motivation to one of ordinary skill in the art to increase the Fe content in a finstock alloy to be greater than 2.0 wt %. See Column 29, lines 55-62, of the Kawahara et al. reference. Referring to Paragraph 52 of Appellants' disclosure, Appellants have unexpectedly discovered that the claimed alloy in combination with controlled casting conditions provides a cast strip having

Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

substantially no coarse intermetallics, such as Fe-bearing intermetallics, which when present produce strip cracks during rolling.

Therefore, since Appellants have unexpectedly provided a high Fe containing alloy that may be cold rolled without substantially cracking, and the Kawahara et al. reference teaches that cracking results when the Fe content is increased to Appellants' Fe range, of greater than 2.0 %, there is no expectation that the Appellants' and Kawahara et al. compositions be so similar that one having ordinary skill in the art would consider the compositions to have the same properties.

Even though the alloy composition disclosed in Kawahara et al. should be found to not touch or overlap Appellant's claimed composition, Appellants note that a prima facie case of obviousness based on overlapping ranges is overcome by showing the criticality of the claimed range. Appellants' can show that a particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

As discussed above, prior to Appellants' discovery, it was believed that Fe contents greater than 2.0 wt % result in cracking during cold rolling, and hence could not be utilized as a heat exchanger material. Referring to Column 29, lines 55-62, of the Kawahara et al. disclosure, Kawahara et al. disclose that "in experiment No. 24, when the Fe content was too large, i.e. Example M having a Fe content of 2.2 wt %, to cause crystallization of the Fe compound as the primary crystallization, the fin material is broken during cast rolling and cold rolling steps, wherein the resultant fin was broken during the core assembly step." Turning to Tables 1 and 2, and paragraphs 60-70 of Appellants' disclosure, Appellants disclose alloy compositions having greater than 2.0 wt. % Fe, i.e. 2.1 wt % and 2.2 wt. %, were cast into metal strip, from which tensile test were conducted and the grain size was maintained to approximately 5,000 microns resulting in substantially no cracking. Appellants' have provided unexpected results of success from a critical element of the alloy composition, therefore overcoming a prima facie case of obviousness, under 35 U.S.C. §103.

In sum, Appellants submit that Kawahara et al. fail to render Appellants' claimed Al-Fe-Si-Mn alloy unpatentable, since Kawahara et al. fail to teach or suggest an alloy for producing substantially breakage free finstock that includes greater than 2.0 wt % Fe, as recited in Claims 1, 10 and 14.

b) There is no motivation to modify the disclosure of Kawahara et al. to meet the limitations of Appellants' alloy composition, as recited in Claim 1, or Appellants' fin structure, as recited in Claim 10, or Appellants' aluminum heat exchanger as recited in Claim 14, since the Kawahara et al. disclosure teaches away from incorporating greater than 2.0 wt % Fe into an Al-Fe-Si-Mn alloy.

The §103 rejection also fails because there is no motivation in Kawahara et al. that suggests modifying the methods and alloys disclosed therein to provide Appellants' claimed aluminum alloy or finstock stock, which includes the features recited in amended Claims 1, 10 and 14. The rejections are thus improper since the prior art does not suggest this drastic modification. The law requires that a prior art reference provide some teaching, suggestion, or motivation to make the modification obvious.

Here, there is no motivation provided in the disclosures of the applied prior art reference, Kawahara et al., or otherwise of record, which would lead one skilled in the art to modify the alloy of the Kawahara et al. to include greater than 2.0 wt % Fe. Appellants submit that one skilled in the art would not modify the Kawahara et al. disclosure to meet the limitations of Appellants' invention, since Kawahara et al. teach away from Appellants' claimed Fe content. It is improper to modify references where the reference teaches away from the proposed modification. *See In re Graselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

Kawahara et al. disclose that AlFeMnSi compositions including greater than 2.0 wt % Fe break during cold rolling and therefore would not be suitable for finstock applications. *See* Column 29, lines 55-62 of the Kawahara et al. reference. Referring to Column 10, lines 24-27, Kawahara et al. further teach that the crystallize materials resulting from the increased Fe content results in breakage of the fin material during the cold-roll step and cutting of the fin in assembling the core. There is no teaching throughout the Kawahara et al. disclosure that an aluminum alloy including Appellants' claimed Fe content (greater than 2.0 wt %) would provide an aluminum finstock without resulting in breakage or cracking.

The only disclosure of an alloy composition meeting the limitation of Appellants' claimed Fe content in the Kawahara et al. reference was provided in illustrative Example M, in which an

Baumann et al.
USPN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

alloy was provided having a Fe content that resulted in breakage during cold rolling. Referring to Column 29, lines 55-62, Kawahara et al. further disclose that "in experiment No. 24, since the Fe content was too large to cause crystallization of the Fe compound as the primary crystallization, thereby the fin material was broken during the cast rolling and cold rolling steps, and the resultant fin was broken during the core assembly step." Example M further teaches away from incorporating an Fe content within Appellants' claimed composition by providing evidence of failure. Example M includes on the order of 2.2 wt % Fe. Therefore, since Kawahara et al. disclose that Fe concentrations greater than 2.0 wt % results in breakage during cold rolling, one having ordinary skill in the art would not modify the alloy composition disclosed in Kawahara et al. to include greater than 2.0 wt % Fe for finstock applications, as claimed by the Appellants.

If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no motivation to make the proposed modification. *In re Gordan*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Therefore, since the Kawahara et al. reference discloses that increasing the Fe content to greater than 2.0 wt % results in breakage of the finstock during rolling process steps, there is no motivation for one to modify the disclosure of Kawahara et al. to meet the limitations of Appellants' claims.

c) Doko et al. alone or in combination with Kawahara et al. fail to render Claims 1-18 unpatentable, under 35 U.S.C. 103, since Doko et al. fails to teach or suggest an AlFeMnSi alloy compositions including greater than 2.0 wt % Fe.

Referring to Page 4 of the Final Rejection dated May 8, 2006, the Examiner states that the breakage disclosed in Example M of the Kawahara et al. reference was not attributed to the increased Fe content and alleges that one skilled in the art would be motivated to increase the Fe content in Kawahara et al. by the teaching of Doko et al. First, as discussed above, in addition to Example M, the Kawahara et al. disclosure in its entirety teaches that an Fe can not be increased to greater than 2.0 wt % without resulting in breakage. Further, the Examiner fails to provide any reason why one skilled in the art would combine an Al-Ni-Fe metallurgical system, as taught by Doko et al., with an Al-Fe-Si-Mn metallurgical system, as taught by Kawahara et al., to arrive at

Appellants' invention recited in Claims 1, 10 and 14. Additionally, Kawahara et al. teach away from combinations with Al-Ni-Fe alloy systems, as taught by Doko et al., since Column 1, lines 60-65, of Kawahara et al. reference discloses that Al-Ni-Fe systems are disadvantageously not suitable for thinning and finstock applications as having insufficient corrosion resistance.

As discussed above, it is disclosed throughout the Kawahara et al. reference that Al-Fe-Mn-Si compositions including greater than 2.0 wt % Fe break during cold rolling and therefore would not be suitable for finstock applications. See Column 29, lines 55-62 of the Kawahara et al. reference. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no motivation to make the proposed modification. *In re Gordan*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Here one of ordinary skill in the art would not modify the disclosure of Kawahara et al. to include the claimed Fe content, since it has been taught throughout the Kawahara et al. reference that such a modification would reduce the alloy's use as a finstock material.

Doko et al. fail to fulfill the deficiencies of Kawahara et al., since Doko et al. also fail to teach or suggest a crack free finstock formed of an Al-Fe-Si-Mn alloy containing greater than 2.0 wt % Fe, as recited in amended Claims 1, 10 and 14. Doko et al. disclose an Al-Ni-Fe alloy and is far removed from Appellants' claimed alloy. Doko et al. fail to teach or suggest an alloy including Mn as required by Appellants' alloy recited in Claims 1, 10 and 14. Appellants' alloy is an Al-Fe-Si-Mn alloy system, which is metallurgically different than the Al-Ni-Fe alloy system disclosed in Doko, et al. Therefore, since Doko et al. fail to disclose an Al-Fe-Si-Mn alloy, Doko et al. fail to teach or suggest a crack free finstock formed of an Al-Fe-Si-Mn alloy containing greater than 2.0 wt % Fe, as recited in Claims 1, 10 and 14.

The §103 rejection also fails because there is no motivation to combine the disclosures of Kawahara et al. and Doko et al. to provide Appellants' claimed finstock, which includes the features recited in Claims 1, 10 and 14. The rejections are thus improper since the prior art does not suggest this drastic modification. The law requires that a prior art reference provide some teaching, suggestion, or motivation to make the modification obvious.

Here, there is no motivation provided in the disclosures of the applied prior art reference, or otherwise of record, which would lead one skilled in the art to modify the alloy of the Kawahara et al. to include greater than 2.0 wt % Fe. Referring to Page 2 of the Office Action

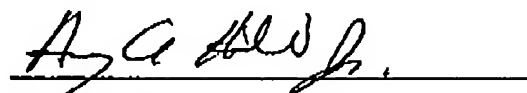
Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

dated May 8, 2006, the Examiner merely states that Doko et al. teaches that Fe values above 2.0 wt % can be successfully incorporated into an Al-Ni-Fe alloy and that Kawahara et al. disclose that it is advantageous to include Mn in the range of 0.6-1.8 wt % in an Al-Fe-Si-Mn alloy. The Examiner provides no rational, motivation or reason for one having skill in the art to combine the disclosure of entirely different alloys in a manner that results in Appellants' invention. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d, 1260, 1266, 23 USPQ 1780, 1783-84 (Fed. Cir. 1992). Appellants' further submit that one skilled in the art would not combine the Kawahara et al. and Doko et al. disclosures to meet the limitations of Appellants' invention, since the applied prior art references teach away from one another and the Appellants claimed Fe content. It is improper to modify or combine references where the reference teaches away from the proposed modification. *See In re Graselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

Conclusion

The above arguments establish that all of the claims on appeal are enabled, definite and patentable over the substantive grounds of rejection raised in the Final Rejection. Appellants therefore respectfully request that the substantive ground used in rejecting Claims 1-17, on appeal, made by the Examiner, be reversed by the Board of Patent Appeals and Interferences.

Respectfully submitted,



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Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

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CLAIMS APPENDIX

10. The claims on appeal for U.S. Application Serial No. 10/755,632, filed January 12, 2004.

1. (Amended) A finstock comprising:

an aluminum alloy comprised of about 0.7-1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1.0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with the remainder comprising Al and tolerable Impurities, wherein the aluminum alloy when cast into an alloy strip and reduced by cold rolling produces a finstock that is substantially free of breakage.

2. The finstock of claim 1 wherein said tolerable impurities comprise at least one of the following:

up to about 0.2% Cu, up to about 0.2% Zr, up to about 0.05% Cr and up to about 0.3% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.4%.

3. The finstock of claim 2 wherein said tolerable impurities are comprised of up to about 0.05% Cu, up to about 0.05% Zr, up to about 0.05% Cr and up to about 0.05% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.10%.

4. (Amended) The finstock of claim 2 wherein said aluminum alloy is comprised of about 0.8-1.1% Si, greater than 2.0 to about 2.2% Fe, about 0.6-0.8% Mn, up to about 1.5% Zn, up to about 0.2% Mg, up to about 0.05% Ti, and up to about 0.03% In.

5. The finstock of claim 4 wherein said tolerable impurities are comprised of up to about 0.05% Cu, up to about 0.05% Zr, up to about 0.05% Cr and up to about 0.05% Ni, with the aggregate of all of said tolerable impurities not to

exceed about 0.10%.

6. The finstock of claim 1 including a post-braze electrical conductivity of greater than about 48% IACS.

7. The finstock of claim 6 wherein said post-braze electrical conductivity is greater than about 50% IACS.

8. The finstock of claim 6 including a post-braze Ultimate Tensile Strength of greater than about 120Mpa.

9. The finstock of claim 8 wherein said post-braze ultimate tensile strength is greater than about 130Mpa.

10. (Amended) A fin for a heat exchanger, comprising:
an aluminum alloy finstock comprised of about 0.7-1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1.0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with the remainder comprising Al and tolerable impurities, wherein the aluminum alloy finstock is reduced by cold rolling into a fin for a heat exchanger that is substantially free of cracks.

11. The fin of claim 10 wherein said tolerable impurities comprise at least one of the following:
up to about 0.2% Cu, up to about 0.2% Zr, up to about 0.05% Cr and up to about 0.3% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.4%.

12. The fin of claim 11 wherein said tolerable impurities are comprised of up to about 0.05% Cu, up to about 0.05% Zr, up to about 0.05% Cr and up to about 0.05% Ni, with the aggregate of all of said tolerable impurities not to

exceed about 0.10%.

13. The fin of claim 11 wherein said aluminum alloy is comprised of about 0.8-1.1% Si, about 2.0-2.2% Fe, about 0.6-0.8% Mn, up to about 1.5% Zn, up to about 0.2% Mg, up to about 0.05% Ti, and up to about 0.03% In.

14. (Amended) A brazed aluminum heat exchanger comprising:
at least one tank structured to hold a coolant;
a header plate coupled to said at least one tank, said header plate including a plurality of apertures;
a plurality of substantially parallel fluid-carrying tubes each extending substantially perpendicular from one of said plurality of apertures in said header plate and structured to receive said coolant therethrough; and
a plurality of fins disposed between said plurality of fluid-carrying tubes, said fins being substantially free of cracks and in thermal communication with said plurality of fluid-carrying tubes and structured to transfer heat away therefrom, in order to cool said coolant as it circulates therein, said plurality of fins comprising:
an aluminum alloy finstock comprised of about 0.7-1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1.0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with the remainder comprising Al and tolerable impurities.

15. The heat exchanger of claim 14 wherein said tolerable impurities comprise at least one of the following:
up to about 0.2% Cu, up to about 0.2% Zr, up to about 0.05% Cr and up to about 0.3% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.4%.

16. The heat exchanger of claim 15 wherein said tolerable impurities are comprised of up to about 0.05% Cu, up to about 0.05% Zr, up to about

Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

0.05% Cr and up to about 0.05% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.10%.

17. (Amended) The heat exchanger of claim 15 wherein said aluminum alloy is comprised of about 0.8-1.1 % Si, greater than 2.0 to about 2.2% Fe, about 0.6-0.8% Mn, up to about 1.5% Zn, up to about 0.2% Mg, up to about 0.05% Ti, and up to about 0.03% In.

Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

EVIDENCE APPENDIX

None

Baumann et al.
USSN 10/755,632, filed 1/12/2004
Appellant's Brief on Appeal, filed June 4, 2007

RELATED PROCEEDINGS APPENDIX

None

1350

149 FEDERAL REPORTER, 3d SERIES

summary judgment of non-infringement was properly granted. See *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1311, 46 USPQ2d 1752, 1758 (Fed.Cir.1998) (concluding that "no reasonable jury" could conclude that the accused device infringed under the doctrine of equivalents); *Luitrum Corp. v. Morehouse Indus., Inc.*, 143 F.3d 1456 (Fed.Cir.1998) (same); *Dawn Equip.*, 140 F.3d at 1017, 46 USPQ2d at 1114-15.

b. TP-900

1. **Literal Infringement.** DBI makes two arguments in favor of finding infringement by the TP-900. The first is that the TP-900 infringes because it includes four TP-600s, which infringe. Because we affirmed the district court's judgment of non-infringement of the TP-600, this argument must fail.

[19] DBI also argues that the TP-900 infringes claim 16 because each TP-600 generates an array of "slice data" and the TP-900 system "generates a composite array of data characteristic of the rolled fingerprint image as a mathematical function of overlapping slice data." The district court interpreted claim 16 to require that the "arrays of slice data" must be "data characteristic of the portion of the finger in contact with the surface of the platen at a particular time." Because each of the partial images was itself a composite image, the district court found that the partial images did not contain "data characteristic of the portion of the finger in contact with the surface of the platen at a particular time," and thus did not satisfy this limitation. Again, DBI does not challenge the district court's claim construction on this point. It is undisputed that the resulting partial images are themselves composite images made up by merging image data from a plurality of successive images. As such, we cannot say that the district court erred in granting summary judgment, even when the evidence is viewed most favorably to DBI.

2. **Equivalent Infringement.** DBI does not argue that the TP-900 infringes under the doctrine of equivalents even if there is no literal infringement, other than its argument that the TP-900 infringes because it includes four TP-600s. Thus, infringement of the TP-900 under the doctrine of equivalents stands or (in this case) falls with the TP-600.

Because we conclude that the TP-600 does not infringe, the TP-900 also does not infringe under the doctrine of equivalents.

C. CONCLUSION

For the reasons stated herein, the summary judgments of non-infringement are **AFFIRMED**.

COSTS

Each party to bear its own costs.



In re Denis ROUFFET, Yannick Tanguy
and Frederic Berthault.

No. 97-1492.

United States Court of Appeals,
Federal Circuit.

July 15, 1998.

Applicants sought patent for invention claiming satellite technology to reduce number of necessary "handovers" between beams transmitted by single satellite. The Board of Patent Appeals and Interferences rejected application as obvious, and applicants appealed. The Court of Appeals, Rader, Circuit Judge, held that neither combination of two prior art patents and conference report nor combination of two other prior art patents rendered invention obvious, absent motivation to combine those references.

Reversed.

1. Patents \S 112.3(2)

To reject claims in patent application as obvious, an examiner must show un rebutted prima facie case of obviousness; in absence of proper prima facie case, applicant who complies with the other statutory requirements is entitled to a patent. 35 U.S.C.A. \S 103.

IN RE ROUFFET

Cite as 149 F.3d 1350 (Fed. Cir. 1998)

1351

2. Patents \S 113(6)

On appeal to Board of Patent Appeals and Interferences, patent applicant can overcome a rejection on grounds of obviousness by showing insufficient evidence of prima facie obviousness or by rebutting prima facie case with evidence of secondary indicia of nonobviousness. 35 U.S.C.A. \S 103.

3. Patents \S 113(6)

While Court of Appeals reviews determination of obviousness by Board of Patent Appeals and Interferences in light of entire record, patent applicant may specifically challenge an obviousness rejection by showing that Board reached an incorrect conclusion of obviousness or that Board based its obviousness determination on incorrect factual predicates.

4. Patents \S 113(6)

Court of Appeals reviews ultimate determination of obviousness by Board of Patent Appeals and Interferences as a question of law.

5. Patents \S 16(2), 16.5(1)

The factual predicates underlying an obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art. 35 U.S.C.A. \S 103.

6. Patents \S 113(6)

Court of Appeals reviews factual findings of Board of Patent Appeals and Interferences for clear error, and finding is clearly erroneous when, although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed.

7. Patents \S 36.1(2, 3, 4), 36.2(1)

Objective evidence of invention's nonobviousness includes copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, and skepticism of skilled artisans before the invention. 35 U.S.C.A. \S 103.

8. Patents \S 97

Board of Patent Appeals and Interferences must consider all of patent applicant's evidence in determining whether claimed invention is obvious. 35 U.S.C.A. \S 103.

9. Patents \S 311(5)

Whether the evidence presented suffices to rebut the prima facie case of obviousness is part of the ultimate conclusion of obviousness and is therefore a question of law. 35 U.S.C.A. \S 103.

10. Patents \S 16.5(1)

When rejection of patent application for obviousness depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. 35 U.S.C.A. \S 103.

11. Patents \S 26(1)

When determining the patentability of a claimed invention which combines two known elements, the question in determining issue of obviousness is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. 35 U.S.C.A. \S 103.

12. Patents \S 26(1)

Combination of two prior art patents and conference report did not render obvious invention claiming satellite technology to reduce number of necessary "handovers" between beams transmitted by single satellite, even if combination of references contained all elements claimed in patent application, absent any evidence of motivation to combine such references other than high level of skill in the relevant art. 35 U.S.C.A. \S 103.

13. Patents \S 16(3)

Obviousness is determined from vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains, which is construct akin to "reasonable person" used as reference in negligence determinations and presumes that all prior art references in the field of the invention are available to hypothetical skilled artisan. 35 U.S.C.A. \S 103(a).

14. Patents \S 26(1)

Combination of prior art patents relating to cellular communications systems did not

1352

149 FEDERAL REPORTER, 3d SERIES

render obvious invention claiming satellite technology to reduce number of necessary "handovers" between beams transmitted by single satellite, absent identification of specific principle providing motivation to combine those prior art references. 35 U.S.C.A. § 103.

Richard C. Turner and Grant K. Rowan, Sughrue, Mion, Zinn, Macpeak & Seas, PLLC, Washington, DC, argued for appellants.

David J. Ball, Jr., Associate Solicitor, Office of the Solicitor, Patent and Trademark Office, Arlington, Virginia, argued for appellee. With him on the brief were Nancy J. Linck, Solicitor, Albin F. Drost, Deputy Solicitor, and Craig R. Kaufman, Associate Solicitor. Of counsel was Scott A. Chambers, Associate Solicitor, Office of the Solicitor.

Before PLAGER, Circuit Judge,
ARCHER, Senior Circuit Judge, and
RADER, Circuit Judge.

RADER, Circuit Judge.

Denis Rouffet, Yannick Tanguy, and Frédéric Bethmult (collectively, Rouffet) submitted

application 07/888,791 (the application) on May 27, 1992. The Board of Patent Appeals and Interferences (the Board) affirmed final rejection of the application as obvious under 35 U.S.C. § 103(a). *See Ex parte Rouffet*, No. 96-1553 (Bd. Pat.App. & Int. Apr. 16, 1997). Because the Board reversibly erred in identifying a motivation to combine the references, this court reverses.

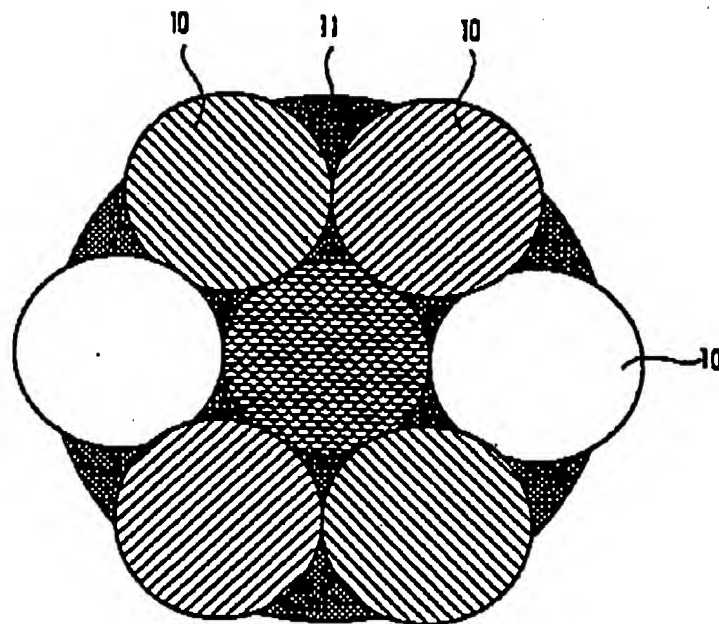
I.

Satellites in a geosynchronous or geostationary orbit remain over the same point on the Earth's surface. Their constant position above the Earth's surface facilitates communications. These satellites project a number of beams to the Earth. Each beam transmits to its area of coverage, or footprint, on the Earth's surface. In order to provide complete coverage, adjacent footprints overlap slightly and therefore must use different frequencies to avoid interference. However, two or more non-overlapping footprints can use the same set of frequencies in order to use efficiently the limited radio spectrum. Figure 1 from the application shows the coverage of a portion of the Earth's surface provided by multiple cone shaped beams:

IN RE ROUFFET
 Cite as 149 F.3d 1350 (Fed. Cir. 1998)

1353

FIG. 1



Frequency reuse techniques, however, have a limited ability to compensate for congestion in geostationary orbits. To alleviate the orbit congestion problem, new telecommunications systems use a network of satellites in low Earth orbit. When viewed from a fixed point on the Earth's surface, such satellites do not remain stationary but move overhead. A satellite's motion as it transmits a plurality of cone-shaped beams creates a new problem. The satellite's movement causes a receiver on the Earth's surface to move from the footprint of one beam into a second beam transmitted by the same satellite. Eventually, the satellite's motion causes the receiver to move from the footprint of a beam transmitted by one satellite into the footprint of a beam transmitted by a second satellite. Each switch from one footprint to another creates a "handover" event analogous to that which occurs when a traditional cellular phone travels from one cell to another. Handovers are undesirable because they

can cause interruptions in signal transmission and reception.

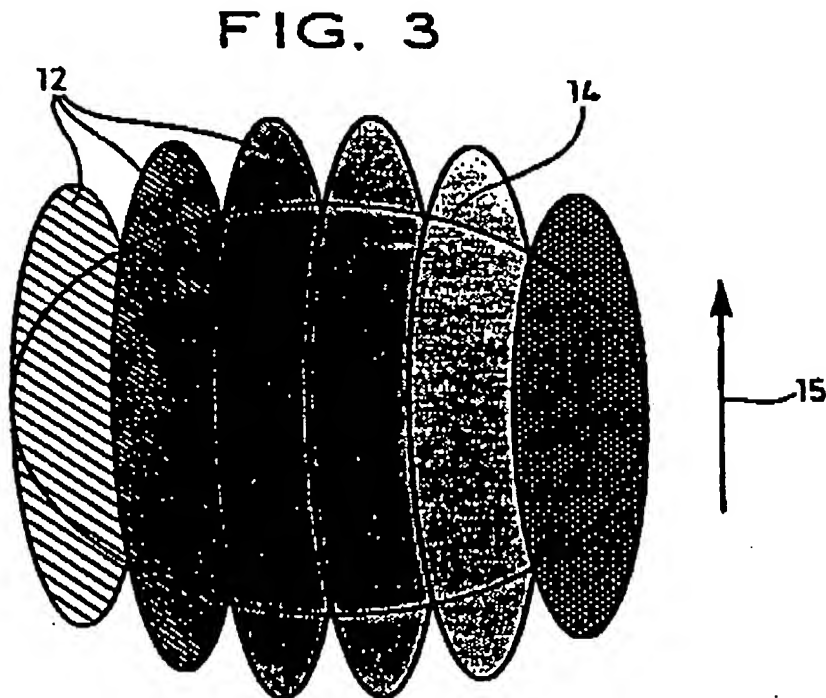
Rouffet's application discloses technology to reduce the number of handovers between beams transmitted by the same satellite. In particular, Rouffet eliminates handovers caused solely by the satellite's motion. To accomplish this goal, Rouffet changes the shape of the beam transmitted by the satellite's antenna. Rouffet's satellites transmit fan-shaped beams. A fan beam has an elliptical footprint. Rouffet aligns the long axis of his beams parallel to the direction of the satellite's motion across the Earth's surface. By elongating the beam's footprint in the direction of satellite travel, Rouffet's invention ensures that a fixed point on the Earth's surface likely will remain within a single footprint until it is necessary to switch to another satellite. Because Rouffet's invention does not address handovers caused by the motion of the receiver across the Earth's

1354

149 FEDERAL REPORTER, 3d SERIES

surface, his arrangement reduces, but does not eliminate, handovers. Figure 3 from the application shows the footprints 12 from six

beams aligned in the direction of satellite motion 15:



The application contains ten claims that stand or fall as a group. Claim 1 is representative:

A low orbit satellite communications system for mobile terminals, wherein the communications antenna system of each satellite provides isoflux coverage made up of a plurality of fan beams that are elongate in the travel direction of the satellite.

The examiner initially rejected Rouffet's claims as unpatentable over U.S. Pat. No. 5,199,672 (King) in view of U.S. Pat. No. 4,872,015 (Rosen) and a conference report entitled "A Novel Non-Geostationary Satellite Communications System," *Conference Record*, International Conference on Com-

munications, 1981 (Ruddy). On appeal to the Board, the examiner added an alternative ground for rejection, holding that the claims were obvious over U.S. Pat. No. 5,394,581 (Freeburg) in view of U.S. Pat. No. 5,170,485 (Levine).

On April 16, 1997, the Board issued its decision. Because Rouffet had specified that the claims would stand or fall as a group based on the patentability of claim 1, the Board limited its opinion to that claim. The Board unanimously determined that the examiner had properly rejected claim 1 as obvious over King in view of Rosen and Ruddy. The Board, on a split vote, also affirmed the rejection over Freeburg in view of Levine.

IN RE ROUFFET

1355

Cite as 149 F.3d 1350 (Fed. Cir. 1998)

II

[1,2] To reject claims in an application under section 103, an examiner must show an un rebutted *prima facie* case of obviousness. See *In re Deuel*, 51 F.3d 1552, 1557, 84 U.S.P.Q.2d 1210, 1214 (Fed.Cir.1995). In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. See *In re Ostiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir.1992). On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness. See *id.*

[3-6] While this court reviews the Board's determination in light of the entire record, an applicant may specifically challenge an obviousness rejection by showing that the Board reached an incorrect conclusion of obviousness or that the Board based its obviousness determination on incorrect factual predicates. This court reviews the ultimate determination of obviousness as a question of law. See *In re Lueders*, 111 F.3d 1569, 1571, 42 U.S.P.Q.2d 1481, 1482 (Fed. Cir.1997). The factual predicates underlying an obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art. See *Monarch Knitting Mach. Corp. v. Sulzer Moral GmbH*, 139 F.3d 877, 881, 45 U.S.P.Q.2d 1977, 1981 (Fed.Cir.1998). This court reviews the Board's factual findings for clear error. See *In re Zurko*, 142 F.3d, 1447, 1449, 46 U.S.P.Q.2d 1691, 1693 (Fed.Cir.1998) (in banc); *Lueders*, 111 F.3d at 1571-72. "A finding is clearly erroneous when, although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed." *In re Graves*, 69 F.3d 1147, 1151, 36 U.S.P.Q.2d 1697, 1700 (Fed.Cir.1995) (quoting *United States v. United States Gypsum Co.*, 333 U.S. 304, 395, 68 S.Ct. 525, 92 L.Ed. 746 (1948)).

[7-9] The secondary considerations are also essential components of the obviousness determination. See *In re Emert*, 121 F.3d 1458, 1462, 44 U.S.P.Q.2d 1149, 1158 (Fed.

Cir.1997) ("Without Emert providing rebuttal evidence, this *prima facie* case of obviousness must stand."). This objective evidence of nonobviousness includes copying, long felt but unsolved need, failure of others, see *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966), commercial success, see *In re Huang*, 100 F.3d 135, 139-40, 40 U.S.P.Q.2d 1685, 1689-90 (Fed.Cir. 1996), unexpected results created by the claimed invention, unexpected properties of the claimed invention, see *In re Mayne*, 104 F.3d 1339, 1342, 41 U.S.P.Q.2d 1451, 1454 (Fed.Cir.1997); *In re Woodruff*, 919 F.2d 1575, 1578, 16 U.S.P.Q.2d 1934, 1936-37 (Fed. Cir.1990), licenses showing industry respect for the invention, see *Arkie Lures, Inc. v. Gene Larsen Tackle, Inc.*, 119 F.3d 953, 957, 43 U.S.P.Q.2d 1294, 1297 (Fed.Cir.1997); *Pentec, Inc. v. Graphic Controls Corp.*, 776 F.2d 309, 316, 227 U.S.P.Q. 766, 771 (Fed.Cir. 1985), and skepticism of skilled artisans before the invention, see *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1532 (Fed.Cir.1988). The Board must consider all of the applicant's evidence. See *Ostiker*, 977 F.2d at 1445 ("An observation by the Board that the examiner made a *prima facie* case is not improper, as long as the ultimate determination of patentability is made on the entire record."); *In re Piasocki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed.Cir.1984). The court reviews factual conclusions drawn from this evidence for clear error. Whether the evidence presented suffices to rebut the *prima facie* case is part of the ultimate conclusion of obviousness and is therefore a question of law.

[10,11] When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See *In re Geiger*, 815 F.2d 686, 688, 2 U.S.P.Q.2d 1276, 1278 (Fed.Cir.1987). Although the suggestion to combine references may flow from the nature of the problem, see *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 U.S.P.Q.2d 1626, 1630 (Fed. Cir.1996), the suggestion more often comes from the teachings of the pertinent references, see *In re Sernaker*, 702 F.2d 989, 994, 217 U.S.P.Q. 1, 5 (Fed.Cir.1983), or from the ordinary knowledge of those skilled in the art that certain references are of special impor-

1356

149 FEDERAL REPORTER, 3d SERIES

tance in a particular field, see *Pro-Mold*, 75 F.3d at 1573 (citing *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297 n. 24, 227 U.S.P.Q. 657, 667 n. 24 (Fed.Cir.1985)). Therefore, "[w]hen determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" See *In re Beatrice*, 974 F.2d 1309, 1311-12, 24 U.S.P.Q.2d 1040, 1042 (Fed.Cir.1992) (quoting *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 U.S.P.Q. 481, 488 (Fed.Cir.1984)).

III

The parties agree that the five references asserted by the examiner are in the same field of endeavor as the invention. The parties also agree that the pertinent level of skill in the art—design of satellite communications systems—is high. On appeal, Rouffet asserts that the examiner and the Board erred by improperly combining references to render the claimed invention obvious.

The Combination of King, Rosen, and Ruddy

[12] The Board first affirmed the rejection of Rouffet's claims over a combination of King, Rosen, and Ruddy. King discloses a system for launching a plurality of satellites into low Earth orbits from a single launch vehicle. Rosen teaches a geostationary satellite that uses a plurality of fan beams with their long axes oriented in an east-west direction to communicate with mobile and fixed terminals on the Earth.

The final, and most important, reference in this combination is Ruddy. Ruddy describes a television broadcast system that uses a series of satellites to retransmit signals sent from a ground station over a wide area. Rather than using a geostationary orbit, Ruddy teaches the use of a series of satellites in Molniya orbits. A satellite in a Molniya orbit always follows the same path through the sky when viewed from a fixed point on the ground. Viewed from the Earth, the orbital path includes a narrow, elliptical apogee loop. In order to transmit to these moving satellites from a ground station, Ruddy uses a fan beam with a long axis aligned with the long axis of the orbit's apogee loop. This alignment places the entire apogee loop

within the footprint of the beam and eliminates the need for the ground station's antenna to track the satellite's motion around the apogee loop. Ruddy further teaches orbit parameters and spacing of multiple satellites to ensure that a satellite is always in the loop to receive and rebroadcast signals from the Earth station.

King and Rosen together teach the use of a network of satellites in low Earth orbit. Thus, Ruddy becomes the piece of the prior art mosaic that shows, in the reading of the Board, the use of "a plurality of fan beams that are elongate in the travel direction of the satellite." Ruddy, however, is different from the claimed invention in several respects. Specifically, the application claims the projection of multiple elliptical fan-shaped footprints from the satellite to the ground. See Claim 1, *supra*, see also Application at 6, lines 9-11 ("In addition, in this system, the geometrical shape of the beams 12 is changed: instead of being circular they are now elongate ellipses."). The application's written description further teaches that the invention's fan-shaped satellite beams will minimize handovers. See *id.* at lines 11-16 ("This considerably increases call durations between handovers.").

In contrast, Ruddy teaches that a ground station may use a single fan-shaped beam to transmit to a satellite in a unique Molniya orbit. The ground station transmits a beam into which a series of satellites in Molniya orbits will successively enter. At least two differences are evident: the application teaches projection of multiple beams from a satellite to the Earth, while Ruddy teaches projection of a single beam from the Earth to satellites. Moreover to the extent Ruddy contains a teaching about handovers, its teachings focus on use of the unique Molniya orbit to ensure that a satellite always falls within the beam transmitted by the ground station.

These differences suggest some difficulty in showing a *prima facie* case of obviousness. The Board, however, specifically found that artisans of ordinary skill in this field of art would know to shift the frame of reference from a ground station following a satellite to a satellite transmitting to the ground. According proper deference to the Board's find-

IN RE ROUFFET

1357

Cite as 149 F.3d 1350 (Fed. Cir. 1998)

ing of a lofty skill level for ordinary artisans in this field, this court discerns no clear error in the Board's conclusion that these differences would not preclude a finding of obviousness. While Ruddy does not expressly teach alignment of the fan beam with the apparent direction of the satellite's motion, this court perceives no clear error in the Board's determination that Ruddy would suggest such an alignment to one of skill in this art. Therefore, the Board did not err in finding that the combination of King, Rosen, and Ruddy contains all of the elements claimed in Rouffet's application.

However, the Board reversibly erred in determining that one of skill in the art would have been motivated to combine these references in a manner that rendered the claimed invention obvious. Indeed, the Board did not identify any motivation to choose these references for combination. Ruddy does not specifically address handover minimization. To the extent that Ruddy at all addresses handovers due to satellite motion, it addresses this subject through the selection of orbital parameters. Ruddy does not teach the choice of a particular shape and alignment of the beam projected by the satellite. Thus Ruddy addresses the handover problem with an orbit selection, not a beam shape. The Board provides no reasons that one of ordinary skill in this art, seeking to minimize handovers due to satellite motion, would combine Ruddy with Rosen and King in a manner that would render the claimed invention obvious.

[13] Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. See 35 U.S.C. § 103(a). This legal construct is akin to the "reasonable person" used as a reference in negligence determinations. The legal construct also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan. See *In re Carlson*, 983 F.2d 1032, 1038, 25 U.S.P.Q.2d 1207, 1211 (Fed. Cir.1993).

As this court has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 698, 698, 218 U.S.P.Q. 865, 870 (Fed.Cir.1983); see also *Richelieu, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 U.S.P.Q. 8, 12 (Fed.Cir.1983) ("Most, if not all, inventions are combinations and mostly

of old elements."). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonica, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 U.S.P.Q.2d 1551, 1554 (Fed.Cir.1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. Rather, just as it relied on the high level of skill in the art to overcome the differences between the claimed invention and the selected elements in the references, it relied upon the high level of skill in the art to provide the necessary motivation. The Board did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the field of art. If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obvi-

1358

149 FEDERAL REPORTER, 3d SERIES

ousness construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See *In re Gorman*, 933 F.2d 982, 986, 18 U.S.P.Q.2d 1885, 1888 (Fed.Cir. 1991). Lacking a motivation to combine references, the Board did not show a proper *prima facie* case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy.

The Combination of Freeburg and Levine

[14] Freeburg teaches a cellular radio-telephone system based on a constellation of low Earth orbit satellites that use conical beams to transmit from the satellite to both fixed and mobile Earth stations. Levine teaches an Earth-based cellular radio system that uses fan beams broadcast from antenna towers. Levine's elliptical footprints are aligned with the road grid. To increase the capacity of traditional ground-based systems through frequency reuse techniques, Levine teaches the use of antennas that broadcast signals with smaller footprints than the prior art system. Thus, Levine actually increases the number of overlap regions between cells and, hence, the number of potential hand-overs. Figure 1 of the Levine patent illustrates its alignment of beam footprints:

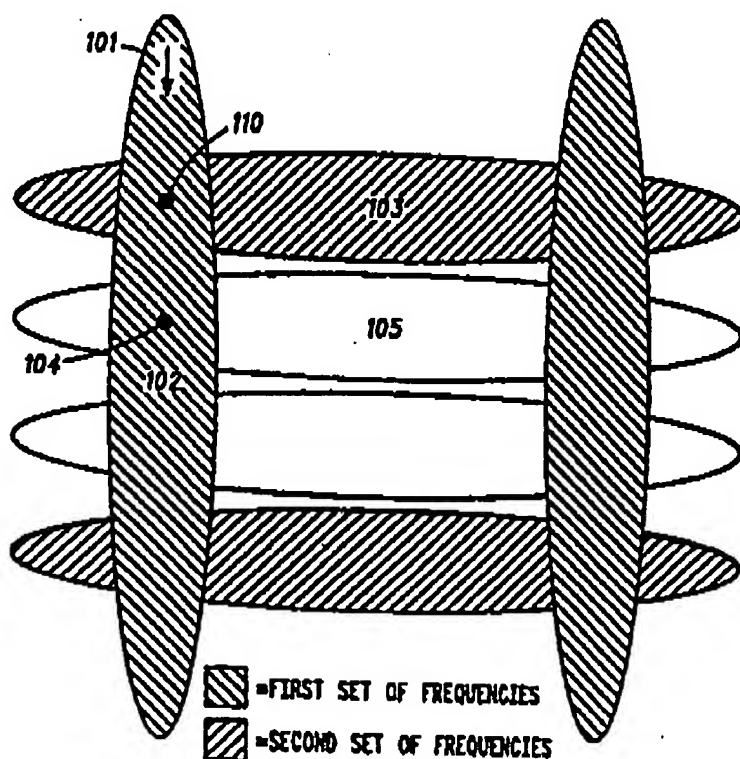


FIG. 1

IN RE ROUFFET

1359

Cite as 149 F.3d 1350 (Fed. Cir. 1998)

As a mobile unit (e.g., a driver using a car phone) moves through a succession of overlapping zones, Levine uses selection algorithms to determine which of the cells is aligned with the travel direction of the mobile unit. These algorithms then select this cell for use while continually monitoring intersecting cells in the event that the mobile unit changes direction.

Once again, this court notes significant differences between the teachings of the application and the Levine-Freeburg combination. The critical Levine reference again involves a beam from an Earth station without any reference to the "travel direction of [a] satellite." Moreover, Levine actually multiplies the number of potential handovers and then uses software to sort out the necessary handovers from the unnecessary. However, the Board explains the reasons that one possessing the lofty skills characteristic of this field would know to account for the differences between the claimed invention and the prior art combination. This court discerns no clear error in that reliance on the considerable skills in this field.

This court does, however, discern reversible error in the Board's identification of a motivation to combine Levine and Freeburg. In determining that one of skill in the art would have had motivation to combine Levine and Freeburg, the Board noted that "[t]he level of skill in the art is very high." As noted before, this observation alone cannot supply the required suggestion to combine these references. The Board posits that the high level of skill in the art overcomes the absence of any actual suggestion that one could select part of the teachings of Levine for combination with the satellite system disclosed by Freeburg.

As noted above, the suggestion to combine requirement is a safeguard against the use of hindsight combinations to negate patentability. While the skill level is a component of the inquiry for a suggestion to combine, a lofty level of skill alone does not suffice to supply a motivation to combine. Otherwise a high level of ordinary skill in an art field would almost always preclude patentable inventions. As this court has often noted, invention itself is the process of combining prior art in a nonobvious manner. See, e.g., *Richdale*, 714 F.2d at 1579; *Environmental*

Designs, 713 F.2d at 698. Therefore, even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. Cf. *Gechter v. Davidson*, 116 F.3d 1454, 43 U.S.P.Q.2d 1030 (Fed.Cir.1997) (explaining that the Board's opinion must describe the basis for its decision). In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.

The Board's naked invocation of skill in the art to supply a suggestion to combine the references cited in this case is therefore clearly erroneous. Absent any proper motivation to combine part of Levine's teachings with Freeburg's satellite system, the rejection of Rouffet's claim over these references was improper and is reversed.

IV

The Board reversibly erred in determining that there was a motivation to combine either the teachings of King, Rosen, and Ruddy or of Freeburg and Levine in a manner that would render the claimed invention obvious. Because this predicate was missing in each case, the Board did not properly show that these references render the claimed invention obvious. Therefore this court reverses the Board's decision upholding the rejection of Rouffet's claims. In light of this disposition, Rouffet's pending motion to remand the case to the Board for further consideration is denied as moot.

COSTS

Each party shall bear its own costs.

REVERSED.



TITANIUM METALS CORP. OF AMERICA v. BANNER**775**

Cite as 775 F.2d 775 (Fed. Cir. 1985)

payer also has elicited testimony indicating that Jane Simon, Inc. was thinly capitalized. The taxpayer argues that it is highly unlikely that the bank would have advanced funds directly to Jane Simon, Inc.—a fledgling enterprise operated by a novice in a highly competitive field. This argument is further supported by the fact that the bank previously had approved a line of credit consistent with the credit enjoyed by Jane Simon, Inc. to Jane Selfe, nee Simon, based upon her pledge of Avondale stock. The government, however, notes that it was at the bank's insistence that the line of credit originally approved for the taxpayer was converted to loans to the corporation guaranteed by the taxpayer.

Accordingly, we conclude that there are material facts still in issue and therefore summary judgment was inappropriate. We remand for a determination of whether or not the bank primarily looked to Jane Selfe for repayment and for the court to apply the factors set out in *In re Lane* and I.R.C. section 885 to determine if the taxpayer's guarantee amounted to either an equity investment in or shareholder loan to Jane Simon, Inc. In short, we remand for the district court to apply *Plantation Patterns* and determine if the bank loan to Jane Simon, Inc. was in reality a loan to the taxpayer.

REVERSED and REMANDED.



**TITANIUM METALS CORPORATION
OF AMERICA, Appellee,**

v.

**Donald W. BANNER, Commissioner of
Patents and Trademarks, Appellant.**

Appeal No. 85-1452.

United States Court of Appeals,
Federal Circuit.

Nov. 7, 1985.

Civil action was brought against Commissioner of Patents and Trademarks au-

thorizing Commissioner to issue patent for titanium alloy. The United States District Court for the District of Columbia, John Garrett Penn, J., authorized Commissioner to issue patent, and Commissioner appealed. The Court of Appeals for the Federal Circuit, Rich, Circuit Judge, held that patent was improperly issued.

Reversed.

1. Patents ¶68

Anticipation under 35 U.S.C.A. § 102 can be found only when reference discloses exactly what is claimed, and when there are differences between reference disclosure and claim, rejection must be based on statute [35 U.S.C.A. § 103] which takes differences into account.

2. Patents ¶324.55(2)

Patent claim interpretation is a question of law free from clearly erroneous standard of review.

3. Patents ¶70

Patent was improperly issued for claims 1 and 2 of patent application for titanium alloy since claims were anticipated under 35 U.S.C.A. § 102 by Russian article which admittedly disclosed alloy on which those claims read.

4. Patents ¶16.34

Specific alloy of claim 3 of patent application for titanium alloy was obvious from known alloys and therefore invalid for obviousness. 35 U.S.C.A. § 103.

Fred E. McKelvey, Deputy Sol., U.S. Patent and Trademark Office of Arlington, Va., argued for appellant. With him on the brief were Joseph F. Nakamura, Sol. and Henry W. Tarring, II, Associate Sol., Washington, DC.

David C. Bruening, Webb, Burden, Robinson & Webb, P.A., of Pittsburgh, Pa., argued for appellee. With him on the brief was Richard L. Byrne.

776

778 FEDERAL REPORTER, 2d SERIES

Before RICH, Circuit Judge, NICHOLS, Senior Circuit Judge, and NEWMAN, Circuit Judge.

RICH, Circuit Judge.

This appeal is from an Order of the United States District Court for the District of Columbia in a civil action brought pursuant to 35 U.S.C. § 145 against Donald W. Banner as Commissioner of Patents and Trademarks¹ authorizing the Commissioner to issue to appellee a patent containing claims 1, 2, and 3 of patent application serial No. 598,935 for "TITANIUM ALLOY." The Commissioner has appealed. We reverse.

Background

The inventors, Loren C. Covington and Howard R. Palmer, employees of appellee to whom they have assigned their invention and the application thereon, filed an application on March 29, 1974, serial No. 455,964, to patent an alloy they developed. The application involved on this appeal is a continuation-in-part thereof, filed July 25, 1975, containing the three claims on appeal. The alloy is made primarily of titanium (Ti) and contains small amounts of nickel (Ni) and molybdenum (Mo) as alloying ingredients to give the alloy certain desirable properties, particularly corrosion resistance in hot brine solutions, while retaining workability so that articles such as tubing can be fabricated from it by rolling, welding and other techniques. The inventors apparently also found that iron content should be limited, iron being an undesired impurity rather than an alloying ingredient. They determined the permissible ranges of the components, above and below which the desired properties were not obtained. A precise definition of the invention sought to be patented is found in the claims, set forth below, claim 3 representing the preferred composition, it being understood, however, that no iron at all would be even more preferred.

1. After suit was brought and before entry of said Order, Commissioner Gerald J. Mossinghoff, Banner's successor in office, was substituted as defendant. He has, in turn, been succeeded by Donald J. Quigg, but no formal substitution of Quigg has been made.

1. A titanium base alloy consisting essentially by weight of about 0.6% to 0.9% nickel, 0.2% to 0.4% molybdenum, up to 0.2% maximum iron, balance titanium, said alloy being characterized by good corrosion resistance in hot brine environments.

2. A titanium base alloy as set forth in Claim 1 having up to 0.1% iron, balance titanium.

3. A titanium base alloy as set forth in Claim 1 having 0.8% nickel, 0.3% molybdenum, up to 0.1% maximum iron, balance titanium.

The examiner's final rejection, repeated in his Answer on appeal to the Patent and Trademark Office (PTO) Board of Appeals (board), was on the grounds that claims 1 and 2 are anticipated (fully met) by, and claim 3 would have been obvious from, an article by Kalabukhova and Mikhayew, *Investigation of the Mechanical Properties of Ti-Mo-Ni Alloys*, Russian Metallurgy (Metally) No. 3, pages 130-133 (1970) (in the court below and hereinafter called "the Russian article") under 35 U.S.C. §§ 102 and 103, respectively. The board affirmed the examiner's rejection. However, it mistakenly proceeded on the assumption that all three claims had been rejected as anticipated under § 102 by the Russian article and ignored the obviousness rejection. On this appeal the PTO says it does not pursue the § 103 rejection further. Appellee proceeds on the basis that only the § 102 rejection is before us.

Both the examiner and the board had before them as evidence three affidavits by Rosenberg, Palmer, and Hall and a declaration by Minkler, by which they were not persuaded of patentability.

The Russian article is short (3 pages), highly technical, and contains 10 graphs as part of the discussion. As its title indicates, it relates to ternary Ti-Mo-Ni alloys, the subject of the application at bar. The examiner and the board both found that it would disclose to one skilled in the art an

TITANIUM METALS CORP. OF AMERICA v. BANNER

777

Cite as 778 F.2d 775 (Fed. Cir. 1985)

alloy on which at least claims 1 and 2 read, so that those claims would not be allowable under the statute because of lack of novelty of their subject matter. Since the article does not specifically disclose such an alloy *in words*, a little thinking is required about what it would disclose to one knowledgeable about Ti-Ni-Mo alloys. The PTO did that thinking as follows:

Figure 1c [a graph] shows data for the ternary titanium alloy which contains Mo and Ni in the ratio of 1:3. Amongst the actual points on the graph is one at 1% Mo + Ni. At this point, the amounts of Mo and Ni would be 0.25% and 0.75% respectively. A similar point appears on the graph shown in Figure 2 of the article.

....

Appellants do not deny that the data points are disclosed in the reference. In fact, the Hall affidavit indicates at least two specific points (at 1% and 1.25% Mo + Ni) which would represent a description of alloys falling within the scope of the instant claims.

On that basis, the board found that the claimed alloys were not new, because they were disclosed in the prior art. It having been argued that the Russian article contains no disclosure of corrosion-resistant *properties* of any of the alloys, the board held:

The fact that a particular property or the end use for this alloy as contemplated by appellants was not recognized in the article is of no consequence.

It therefore held the Russian article to be an anticipation, noting that although the article does not discuss corrosion resistance, it does disclose other properties such as strength and ductility. The PTO further points out that the authors of the reference must have made the alloys to obtain the data points.

Being dissatisfied with the decision of the board, Titanium Metals Corporation of America, as assignee of the Covington and Palmer application, then brought an action in the District Court for the District of Columbia against the Commissioner pursu-

ant to 35 U.S.C. § 145, its complaint alleging that the board's decision "was erroneous and contrary to law," and making proffer of a certified copy of the application and all papers in the file thereof, together with a copy of the Russian article which was the sole basis of the PTO refusal to allow the claims. It prayed that the court adjudge it entitled to a patent containing claims 1-3 and authorize the Commissioner to grant such a patent. The Commissioner filed an answer denying that the applicants were the first inventors of the alloys claimed or entitled to a patent, alleging that the claims are not patentable under the law, and making proffer of the Examiner's Answer, the Board of Appeals' decision, and the prior art reference.

The case came on for trial on January 24, 1980, before the Honorable John G. Penn and was concluded in two and a half hours. The testimony of one witness was heard by the court, Dr. James C. Williams, professor at Carnegie-Mellon University in Pittsburgh and an expert in titanium metallurgy. His testimony was about equally divided between direct and cross examination.

At the conclusion of the plaintiff's case, the following exchange took place between the judge and the Associate Solicitor for the PTO:

THE COURT: All right. Mr. Tarring?

MR. TARRING: Your Honor, generally the position of the Patent Office is we rely on the position of the tribunals below, the examiner and the Board of Appeals and their decisions are both present in the exhibit which I submitted earlier. I was not quite sure whether you would prefer that we have a post-trial brief in the matter. If that's your preference we could do that or I could make an argument on the basis of the law right now. I don't know what your preference would be. Otherwise, I'm not going to call any witnesses.

THE COURT: You are not going to what?

MR. TARRING: I have no intention of calling any witnesses so it's really a matter of argument at this point, I think.

778

778 FEDERAL REPORTER, 2d SERIES

THE COURT: Of course, I have received your pre-trial briefs.

After further discussion, it was settled that both parties would file further briefs after the hearing transcript had been prepared. They were filed in April and May, 1980. On November 16, 1984, the District Court entered the Order appealed from followed on November 28 by a supporting memorandum opinion. January 10, 1985, the PTO filed its Notice of Appeal. This court has heard oral argument and received briefs.

The District Court Opinion

The trial court's memorandum opinion² having been published, we shall merely outline its contents.

After stating the nature of the action and the relief sought, Part I is a summarization of the contents of the patent specification, a statement of the issues, and of the PTO rejection which is stated both correctly as the examiner made it and incorrectly as the board assumed it to be. Part II is a statement of the District of Columbia Circuit Court of Appeals' attitude toward plaintiff's burden on review of the PTO board decisions in § 145 actions, namely, that it is a "heavy burden," "great weight" being given to the PTO decision because of its "expertise," a "thorough conviction" that it erred being required, as well as a lack of a "rational basis for its conclusions." In Part III is a brief discussion of "anticipation" under § 102 with citation of two cases from our predecessor Court of Customs and Patent Appeals, *In re Wilder*, 429 F.2d 447, 57 C.C.P.A. 1314, 166 USPQ 545 (1970), and *In re LeGrice*, 301 F.2d 929, 49 C.C.P.A. 1124, 133 USPQ 365 (1962), with emphasis placed on their holdings that an anticipatory reference must be an "enabling" reference, the implication being that the Russian article perhaps does not enable one to know all the things that the plaintiff's inventors disclosed in their application, such as the range limits of the alloying ingredients Mo and Ni and the

corrosion resistance. The court then states that after considering all of the affidavit and declaration evidence which was before the PTO, it still lacked the necessary "thorough conviction" required to overturn the PTO decision even though, left to its own judgment of the evidence, it would be willing to do so. It then reviewed the evidence of Dr. Williams taken before it. Dr. Williams was qualified as an expert in titanium metallurgy but not in patent law. The questions he was asked, however, pertained to the interpretation of patent claims, as quoted in the court's opinion. The court was of the view that his testimony "fully supports the arguments made by the plaintiff in this case" and found it "to be very persuasive." The court then concluded that claims 1-3 were not anticipated and that claim 3 was wrongly rejected as directed to obvious subject matter. In the court's view, Dr. Williams' testimony tipped the scales in favor of issuing a patent.

OPINION

1. Jurisdiction

This suit was brought in the district court pursuant to 35 U.S.C. § 145. Our jurisdiction rests on 28 U.S.C. § 1295(a)(4)(C) which provides as follows: § 1295. *Jurisdiction of the United States Court of Appeals for the Federal Circuit*

(a) The United States Court of Appeals for the Federal Circuit shall have exclusive jurisdiction—

....

(4) of an appeal from a decision of—

....

(C) a district court to which a case was directed pursuant to section 145 or 146 of title 35;

This case having been directed to the District Court for the District of Columbia by § 145, this court's jurisdiction is *exclusive* of the Court of Appeals for the District of

225 USPQ 673 (D.D.C.1984).

2. Reported sub nom. *Titanium Metals Corporation of America v. Mossinghoff*, 603 F.Supp. 87,

TITANIUM METALS CORP. OF AMERICA v. BANNER

779

Cite as 778 F.2d 773 (Fed. Cir. 1985)

Columbia and is therefore governed by the precedents of this court and its predecessor courts. See *South Corporation v. United States*, 690 F.2d 1368, 215 USPQ 657 (Fed. Cir.1982).

Strange as it may seem to any district judge not to be governed by the precedents of his own Court of Appeals, that is the situation created by Congress in the Federal Courts Improvement Act of 1982, § 402 of Pub.L. 97-164, Apr. 2, 1982, 96 Stat. 37, effective Oct. 1, 1982, in the interest of promoting a uniform patent law by having only one Court of Appeals deciding questions of patent law, whether review be of decisions of the Patent and Trademark Office or of district court judgments in cases arising under the patent laws of the United States. Cf. § 1295(a)(1). We do not fault the district judge, however, for having stated the precedents of his own circuit in this § 145 case because this is one of the first occasions we have had to review a judgment in such a case. Nor do we need to determine whether we should apply those precedents here.

2. The rejections under review

Tracing the PTO rejections under review below, we encounter confusion. Although we are reviewing the judgment (in the form of an order) of the district court,³ the effect of that order is to hold that the PTO's rejections of claims 1-3 were in error. The actual holding of the district court was:

The Court concludes that Claims 1, 2 and 3 should not have been rejected on the basis of anticipation pursuant to 35 U.S.C. § 102. Moreover, the Court concludes that Claim 3 should not have been rejected as being obvious pursuant to 35 U.S.C. § 103.

Thus, the Court finds as a fact and concludes as a matter of law that the

decision of the Board of Appeals was in error. The testimony of Dr. Williams, which remains uncontradicted, adds sufficient weight to the plaintiff's side to tip the scales and, in the Court's view, to result in clear and convincing evidence that the application should not have been rejected.

Thus, the court deemed all three claims to have been rejected for anticipation under § 102. The examiner never so rejected claim 3. The board opinion, as above noted, erroneously assumed that he had, never gave any special or separate attention to claim 3, never discussed obviousness or § 103, and concluded its opinion with the words "The decision of the examiner is affirmed." The board made no new rejection, as it might have done, under 37 C.F.R. § 196(b). Under these circumstances, we shall assume that the board intended to, and did, affirm *only* the rejection that the examiner had made, as we have stated at the beginning, and that the only rejection outstanding against claim 3 is for obviousness under § 103.

The district court assumed there were *two* outstanding rejections against claim 3. We have reduced it to one.

The appellee, because it quite evidently suits its argument best, has preferred to ignore the § 103 rejection of claim 3, but we do not because it exists in the official record.

[1] The PTO brief says the Commissioner "is not pursuing" the § 103 rejection in this court, but it is before us whether or not pursued by the PTO. The PTO Solicitor developed a new theory in his brief, never propounded by either the examiner or the board, to support a § 102 rejection of claim 3 on the Russian article,⁴ but that

1, 2 and 3 in due form as prescribed by the Patent Laws of the United States.

The ultimate issue actually before us is *whether the patent laws permit the Commissioner to issue such a patent.*

4. Resting on the fact that the Russian Article discloses an alloy containing 0.75% Ni and 0.25% Mo, the Solicitor's argument is as follows:

3. The Order entered Nov. 16, 1984, after preliminary recitations, reads as follows:

ORDERED that the Commissioner of Patents and Trademarks is authorized to issue to plaintiff, Titanium Metals Corporation of America, as assignee and owner of application Serial No. 598,935, United States Letters Patent on Titanium Alloy including Claims Nos.

778 F.2d-19

was clearly beyond his province and we disregard it as amounting to a new ground of rejection. We also disregard it as contrary to many holdings of this court and its predecessors that anticipation under § 102 can be found only when the reference discloses exactly what is claimed and that where there are differences between the reference disclosure and the claim, the rejection must be based on § 103 which takes differences into account. *D. Chisum, Patents* § 3.02.

We have undertaken to settle the question whether we are dealing with one ground of rejection or two for the further reason that the standard of review of this court may vary in accordance with what the rejection is and whether it is considered to be a finding of fact or a conclusion of law. We have held that anticipation is a finding of fact, reviewable under the "clearly erroneous" standard, *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 225 USPQ 634 (Fed.Cir. 1985), and that obviousness is a conclusion of law not subject to that restraint, but is freely reviewable. *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 1344, 220 USPQ 777, 782 (Fed.Cir.1984). That may make a difference in our review.

3. The merits

Finding, as we do, that claim 3 was never purposefully rejected under § 102, both the board and the district court being confused about that fact, we are left with the propriety of the rejection of claims 1 and 2 under § 102 and the rejection of claim 3 under § 103, both rejections having been held by the district court to have been erroneous. That necessarily follows from the court's conclusion "that the Claims are patentable." We find that conclusion contrary to

Moreover, this alloy falls within the scope of claim 3, which specifies 0.8% nickel, 0.3% molybdenum, up to 0.1% iron and balance titanium. Inasmuch as this claim specifies the content of nickel and molybdenum to a tenth of a percent, the claim, given the broadest reasonable interpretation, would cover alloys the amounts of whose contents would correspond to the claim language when ex-

statutory law and will deal with the two grounds of rejection separately.

A. Anticipation, § 103

From consideration of the trial court's memorandum opinion, we are unable to determine whether it erred because of misconstruction of the claims, misreading of what the reference discloses, lack of proper advice on the requirements of the patent statute respecting patentability, or the technical legal meaning of "anticipation," a term which some courts have erroneously used from time to time.

We are left in no doubt that the court was impressed by the totality of the evidence that the applicants for patent had discovered or invented and disclosed knowledge which is not to be found in the reference, nor do we have any doubt about that ourselves. But those facts are beside the point. The patent law imposes certain fundamental conditions for patentability, paramount among them being the condition that what is sought to be patented, as determined by the claims, be new. The basic provision of Title 35 applicable here is § 101, providing in relevant part: "Whoever invents or discovers any new ... composition of matter, or any new ... improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." (Emphasis ours.) The title of the application here involved is "Titanium Alloy," a composition of matter. Surprisingly, in all of the evidence, nobody discussed the key issue of whether the alloy was new, which is the essence of the anticipation issue, including the expert Dr. Williams. Plaintiff's counsel, bringing Dr. Williams' testimony to its climax, after he had explained the nature of the ingredients, the alloys made therefrom, and their superior corrosion resistance in hot brine,

pressed in tenths of a percent. Following the usual convention of rounding off hundredths to tenths by increasing the tenths digit by one when the hundredths digit to be dropped is five or greater, the alloy of the Russian article, expressed in tenths of a percent, would contain 0.8% nickel, 0.3% molybdenum and balance titanium, corresponding to the alloy specified in tenths of a percent in claim 3.

TITANIUM METALS CORP. OF AMERICA v. BANNER

781

Cite as 778 F.2d 775 (Fed. Cir. 1985)

etc., repetitively asked him such questions as "Does the [Russian] article *direct you* as one skilled in the art to a titanium alloy having nickel present in an amount between .6 and .9 percent molybdenum in an amount between .2 and .4 percent?" (emphasis ours) followed by "Is there anything mentioned in the article about corrosion resistance?" Of course, the answers were emphatically negative. But this and like testimony does not deal with the critical question: do claims 1 and 2, to which the questions obviously relate, *read on or encompass* an alloy which was already known by reason of the disclosure of the Russian article?

Section 102, the usual basis for rejection for lack of novelty or anticipation, lays down certain principles for determining the novelty required by § 101, among which are the provisions in § 102(a) and (b) that the claimed invention has *not* been "described in a printed publication in this or a foreign country," either (a) before the invention by the applicant or (b) more than one year before the application date to which he is entitled (strictly a "loss of right" provision similar to novelty). Either provision applies in this case, the Russian article having a date some 5 years prior to the filing date and its status as "prior art" not being questioned. The PTO was never specific as to what part of § 102 applies, merely rejecting on § 102. The question, therefore, is whether claims 1 and 2 encompass and, if allowed, would enable plaintiff-appellee to exclude others from making, using, or selling an alloy *described* in the Russian article. See 35 U.S.C. § 154. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed.Cir.1983).

To answer the question we need only turn to the affidavit of James A. Hall, a metallurgist employed by appellee's Tl-MET Division, who undertook to analyze the Russian article disclosure by calculating the ingredient percentages shown in the graph data points, which he presented in tabular form. There are 15 items in his table. The second item shows a titanium base alloy containing 0.25% by weight Mo and 0.75% Ni and this is squarely within

the ranges of 0.2-0.4% Mo and 0.6-0.9% Ni of claims 1 and 2. As to that disclosed alloy of the prior art, there can be no question that claims 1 and 2 read on it and would be infringed by anyone making, using, or selling it. Therefore, *the statute prohibits* a patent containing them. This seems to be a case either of not adequately considering the novelty requirement of the statute, the true meaning of the correlative term "anticipation," or the meaning of the claims.

By reason of the court's quotations from cases holding that a reference is not an anticipation which does not enable one skilled in the art to practice the claimed invention, it appears that the trial court thought there was some deficiency in the Russian article on that score. Enablement in this case involves only being able to make the alloy, given the ingredients and their proportions without more. The evidence here, however, clearly answers that question in two ways. Appellee's own patent application does not undertake to tell anyone how to make the alloy it describes and seeks to patent. It assumes that those skilled in the art would know how. Secondly, appellee's expert, Dr. Williams, testified on cross examination that given the alloy information in the Russian article, he would know how to prepare the alloys "by at least three techniques." Enablement is not a problem in this case.

As we read the situation, the court was misled by the arguments and evidence to the effect that the inventors here found out and disclosed in their application many things that one cannot learn from reading the Russian article and that this was sufficient in law to justify granting them a patent for their contributions—such things as what good corrosion resistance the claimed alloys have against hot brine, which possibly was not known, and the range limits of the Ni and Mo content, outside of which that resistance diminishes, which are teachings of very useful information. These things the applicants teach the art and the Russian article does not. Indeed, appellee's counsel argued in his open-

